



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/817,012	04/01/2004	Winthrop D. Childers	200315934-1	2745
22879	7590	10/06/2005	EXAMINER	
HEWLETT PACKARD COMPANY P O BOX 272400, 3404 E. HARMONY ROAD INTELLECTUAL PROPERTY ADMINISTRATION FORT COLLINS, CO 80527-2400			SHEPARD, JUSTIN E	
			ART UNIT	PAPER NUMBER
			2617	

DATE MAILED: 10/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/817,012	Applicant(s) CHILDERS ET AL.	
	Examiner Justin E. Shepard	Art Unit 2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-58 and 61-67 is/are pending in the application.
- 4a) Of the above claim(s) 59 and 60 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-58 and 61-67 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 9/12/2005 have been fully considered but they are not persuasive.

The arguments for claims 1 and 27 were considered, but the examiner still holds that the prior art (Songer) meets the limitations of the claims. Specifically the claim states that the 3D image is made up of subframes, while the 2D image is not. It is widely known that normal 2D displays (televisions) output frames as subframes referred to as fields.

The rejections of claims 1, 27, and any claims dependent on these claims remain valid.

The arguments for claims 19, 48, and 66 were considered, but the examiner still holds that the prior art (Divelbiss) meets the limitations of the claims. Specifically the claims call for 2 distinct groups of colors. The examiner holds that a pair of glasses with one lens for filtering magenta, and the other for filtering green still can be considered to meet the limitations of the claims. The green filter would allow more than a single color through to the user (be it that they are all green filtered), and the group of colors allowed to pass through would be distinct from the group of colors let through by the magenta filter.

The rejections of claims 19, 48, 66, and any claims dependent on these claims remain valid.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 61 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The last 2 lines of claim 61 do not have support in the disclosure. Paragraph 50 of the specification states that "the 2D image frame includes all the colors that are included in both the right and left image sub-frames." Please indicate where the support for this claim limitation is located in the disclosure.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 5, 6, 7, 27, 28, 29 33, 34, 35, 45, 46, 64, and 65 are rejected under 35 U.S.C. 102(b) as being anticipated by Songer.

2. Referring to claim 1, Songer discloses a method of displaying an image frame in three dimensions (3D) or in two dimensions (2D) with a single light engine (abstract,

lines 1-3), said method comprising: selecting between a 2D mode of operation and a 3D mode of operation (abstract, lines 20-23; Note: removing or putting on the glasses is interpreted as selecting a mode); generating a left image sub-frame and a right image sub-frame if said 3D mode of operation is selected (abstract, lines 20-21); and generating a 2D image frame if said 2D mode of operation is selected (abstract, lines 22-23); wherein said left image sub-frame defines a visual perspective of a left eye and said right image sub-frame defines a visual perspective of a right eye during a frame period if said 3D mode of operation is selected and said 2D image frame is displayed during said frame period if said 2D mode of operation is selected (column 5, lines 40-41, 48-50).

3. Referring to claim 5, Songer discloses a method of claim 1, further comprising: dividing said frame period into a first sub-frame period and a second sub-frame period; displaying said left image sub-frame during said first sub-frame period; and displaying said right image sub-frame during said second sub-frame period (column 9, lines 59-65; figure 15).

4. Referring to claim 6, Songer discloses a method of claim 1, further comprising: dividing said frame period into a number of sub-frame periods; displaying said left image sub-frame during one or more of said sub-frame periods; and displaying said right image sub-frame during one or more of said sub-frame periods; wherein said left and right image sub-frames are displayed in an interleaved manner (column 10, lines 6-10; figure 16).

5. Referring to claim 7, Songer discloses a method of claim 1, further comprising viewing said left and right image sub-frames through glasses comprising a left lens configured to allow a left eye to only perceive said left image sub-frame and a right lens configured to allow a right eye to only perceive said right image sub-frame (column 5, lines 63-67; column 6, lines 30-35).

6. Referring to claim 27, Songer discloses a system with a selectable mode of operation for displaying an image frame in three dimensions (3D) or in two dimensions (2D), said system comprising: a spatial light modulator; and an image processing unit configured to control said spatial light modulator (column 5, lines 59-62) in a selected mode of operation which is either a 3D mode of operation or a 2D mode of operation (abstract, lines 20-23; Note: removing or putting on the glasses is interpreted as selecting a mode); wherein if said selected mode of operation is said 3D mode of operation, said spatial light modulator generates a left image sub-frame carrying a left eye perspective and a right image sub-frame carrying a right eye perspective during a frame period (abstract, lines 20-21) and if said selected mode of operation is said 2D mode of operation, said spatial light modulator generates a 2D image frame to be displayed on said viewing surface during said frame period (abstract, lines 22-23).

7. Referring to claims 28 and 29, Songer discloses a system of claim 27, wherein said image processing unit comprises: a 3D coordinate conversion function configured to generate left and right image sub-frame data defining said left and right image sub-frames; wherein said spatial light modulator is configured to generate said left and right image sub-frames in accordance with said left and right image sub-frame data (figure

12); and where the image processing unit further comprises: a 2D coordinate conversion function configured to generate 2D image frame data defining said 2D image frame; wherein said spatial light modulator is further configured to generate said 2D image frame in accordance with said 2D image frame data (figure 12; Note: as the same frames used for the 3D image as are used for the 2D image, therefore any coordinate conversion performed on the 3D image would be performed on the 2D image).

8. Referring to claims 33 and 34, Songer discloses a system of claim 27, wherein said frame period comprises a first sub-frame period and a second sub-frame period, said left image sub-frame being displayed during said first sub-frame period and said right image sub-frame being displayed during said second sub-frame period (column 9, lines 59-65); and where the frame period comprises a number of sub-frame periods, wherein said left and right image sub-frames are each displayed during one or more of said sub-frame periods in an interleaved manner (column 10, lines 6-11).

9. Referring to claim 35, Songer discloses a system of claim 27, further comprising glasses, said glasses comprising: a left lens configured to allow a left eye of a user of said glasses to only perceive said left image sub-frame; and a right lens configured to allow a right eye of a user of said glasses to only perceive said right image sub-frame (column 5, lines 63-64; column 6, lines 30-35).


Referring to claim 45, Songer discloses a system of claim 27, wherein said mode of operation is selected by a user of said display system (column 6, lines 30-35; Note: removing or putting on the glasses is interpreted as selecting a mode).

Referring to claim 46, Songer discloses a system of claim 27, wherein said mode of operation is selected automatically without user intervention (column 6, lines 30-35; Note: since the user does not need to have contact with the display system to use it in 3D mode, it is interpreted as being selected (from the system's point of view) automatically without any interference from the user).

10. Referring to claim 64, Songer discloses a system of claim 61, further comprising: means for dividing said frame period into a first sub-frame period and a second sub-frame period; means for displaying said left image sub-frame during said first sub-frame period; and means for displaying said right image sub-frame during said second sub-frame period (column 9, lines 59-65; figure 15).

Referring to claim 65, Songer discloses a system of claim 61, further comprising: means for dividing said frame period into a number of sub-frame periods; means for displaying said left image sub-frame during one or more of said sub-frame periods; and means for displaying said right image sub-frame during one or more of said sub-frame periods; wherein said left and right image sub-frames are displayed in an interleaved manner (column 10, lines 6-10; figure 16).

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

 11. Claims 19, 20, 21, 22, 23, 24, 48, 49, ⁵³55, 56, and 66 are rejected under 35

U.S.C. 102(e) as being anticipated by Divelbiss.

Referring to claim 19, Divelbiss discloses a method of displaying an image in three dimensions during a frame period, said method comprising: generating a left image sub-frame and a right image sub-frame, said left image sub-frame defining a visual perspective of a left eye and said right image sub-frame defining a visual perspective of a right eye for said image (page 11, paragraph 177); displaying said left image sub-frame utilizing a first plurality of colors; and displaying said right image sub-frame utilizing a second plurality of colors; wherein said first plurality of colors is distinct from said second plurality of colors (page 18, paragraph 222, lines 1-7, 14-20).

Referring to claim 20, Divelbiss discloses a method of claim 19, wherein said first plurality of colors and said second plurality of colors comprise different sets of primary colors (page 18, paragraph 222, lines 1-7, 14-20).

12. Referring to claim 21, Divelbiss discloses a method of claim 19, further comprising: dividing said frame period into a plurality of sub-frame time periods including at least one left sub-frame time period and one right sub-frame time period; displaying said left image sub-frame during said at least one left sub-frame time period; and displaying said right sub-frame image during said at least one right image sub-frame time period (page 11, paragraph 177).

Referring to claim 22, Divelbiss discloses a method of claim 19, wherein said left image sub-frame is displayed during a first portion of said frame period and said right image sub-frame is displayed during a second portion of said frame period, wherein said first portion and said second portion are overlapping (page 11, paragraph 181).


Art Unit: 2617

13. Referring to claim 23, Divelbiss discloses a method of claim 19, wherein said first plurality of colors includes red, green, and blue (page 18, paragraph 222, lines 1-7, 14-20).

Referring to claim 24, Divelbiss discloses a method of claim 19, wherein said second plurality of colors includes red, green, and blue (page 18, paragraph 222, lines 1-7, 14-20).

Referring to claim 48, Divelbiss discloses a device, comprising: an image processing unit configured to generate image sub-frame data; and a color modulator coupled to said image processing unit configured to generate a plurality of image sub-frames based on said image sub-frame data (page 11, paragraph 177); wherein said color modulator generates a first plurality of colors for at least one image sub-frame of said plurality of image sub-frames and a second plurality of colors, distinct from said first plurality of colors (page 18, paragraph 222, lines 1-7, 14-20), for at least one other image sub-frame of said plurality of image sub-frames.

14. Referring to claim 49, Divelbiss discloses a device of claim 48, wherein said first plurality of colors and said second plurality of colors comprise different sets of primary colors (page 18, paragraph 222, lines 1-7, 14-20; Note: because green is made up of blue and yellow, and magenta is made up of blue and red, these are being interpreted as different sets of colors).

 Referring to claim ~~52~~⁵³, Applicant has provided evidence in this file showing that the invention was owned by, or subject to an obligation of assignment to, the same entity as Childers at the time this invention was made, or was subject to a joint research

agreement at the time this invention was made. However, reference Songer additionally qualifies as prior art under another subsection of 35 U.S.C. 102, and therefore, is not disqualified as prior art under 35 U.S.C. 103(c).

Applicant may overcome the applied art either by a showing under 37 CFR 1.132 that the invention disclosed therein was derived from the invention of this application, and is therefore, not the invention "by another," or by antedating the applied art under 37 CFR 1.131.

Referring to claim 53, Divelbiss discloses a 3D imaging device of claim 48, further comprising: at least one set of lenses having a first and second lens wherein said first lens filters out said first plurality of colors and said second lens filters out said second plurality of colors (paragraph 222, lines 14-20).

Referring to claim 55, Divelbiss discloses a device of claim 48, wherein said color modulator displays said at least one image sub-frame and said at least one other image sub-frame at the same time during one frame period (page 11, paragraph 179).

15. Referring to claim 56, Divelbiss discloses a device of claim 48, wherein said color modulator includes an array of pixels and is configured to display said at least one image sub-frame and said at least one other image sub-frame in alternating adjacent pixels during at least a portion of one frame period (page 11, paragraph 181).

Referring to claim 66, Divelbiss discloses a system for displaying an image in three dimensions during a frame period, said system comprising: means for generating a left image sub-frame and a right image sub-frame, said left image sub-frame defining a visual perspective of a left eye and said right image sub-frame defining a visual

perspective of a right eye for said image (page 11, paragraph 177); means for displaying said left image sub-frame utilizing a first plurality of colors; and means for displaying said right image sub-frame utilizing a second plurality of colors; wherein said first plurality of colors is distinct from said second plurality of colors (page 18, paragraph 222, lines 1-7, 14-20).

Claim Rejections - 35 USC § 103

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Songer in view of Stuetzler.

Songer discloses a method of claim 1, wherein said step of generating said left and right image sub-frames comprises: generating left and right image sub-frame data defining said left and right image sub-frames.

Songer does not disclose a method where storing said right image sub-frame data in a second buffer; and controlling a spatial light modulator with said left and right image sub-frame data in said first and second buffers to generate said left and right image sub-frames.

Stuetzler discloses a method where storing said right image sub-frame data in a second buffer; and controlling a spatial light modulator with said left and right image

sub-frame data in said first and second buffers to generate said left and right image sub-frames (column 2, lines 52-56; figure 4, parts 8a).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to add the buffers from Stuetzler to the method disclosed by Songer. The motivation for doing this would have been to allow for the display output to be synced up with the shutter glasses by controlling the outputs of the buffer.

17. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Songer in view of Stuetzler as applied to claims 2 above, and further in view of Hochmuth

Referring to claim 3, Songer and Stuetzler do not disclose a method of claim 2, wherein a single buffer unit comprises said first and second buffers.

Hochmuth discloses a method of claim 2, wherein a single buffer unit comprises said first and second buffers (page 1, paragraph 9, lines 8-15).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to replace the two buffers disclosed in Stuetzler with the single buffer from Hochmuth. The motivation for doing this would have been to reduce the amount of control circuitry by only needing to control a single buffer unit.

Referring to claim 4, Songer does not disclose a method of claim 1, wherein said step of generating said 2D image frame comprises: generating 2D image frame data defining said 2D image frame; storing said 2D image frame data in a buffer; and

controlling a spatial light modulator with said 2D image frame data in said buffer to generate said 2D image frame.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to observe that if the method disclosed by Songer displays images that can be viewed in either two or three dimensions depending on whether or not you're wearing a pair of glasses, that the buffering of the 3D frames described in Hochmuth would also be buffering the 2D frames.

18. Claims 8, 9, 10, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Songer in view of Divelbiss.

Songer does not disclose a method of claim 1, wherein said left image sub-frame comprises a first group of colors and said right image sub-frame comprises a second group of colors distinct from said first group of colors; where the 2D image frame comprises one or more of said colors in said first and second groups of colors; where the first group of colors comprises two or more colors and said second group of colors comprises two or more colors; and where the left image sub-frame and said right image sub-frame have differing polarizations.

Divelbiss discloses a method of claim 1, wherein said left image sub-frame comprises a first group of colors and said right image sub-frame comprises a second group of colors distinct from said first group of colors; where the 2D image frame comprises one or more of said colors in said first and second groups of colors; where the first group of colors comprises two or more colors and said second group of colors

Art Unit: 2617

comprises two or more colors (page 18, paragraph 222, lines 1-7, 14-20; Note: because green is made up of blue and yellow, and magenta is made up of blue and red, these are being interpreted as different sets of colors; Note: since the 3D and 2D image signals do not vary in the method disclosed by Songer the 2D image frame would be the same as the 3D image frame); and where the left image sub-frame and said right image sub-frame have differing polarizations (page 17, paragraph 215, lines 1-5).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to replace the shutter glasses method disclosed in Songer with the color and polarization method disclosed in Divelbiss. The motivation for doing this would have been to use a simpler passive system as compared to the complex syncing circuitry needed to keep the shutter glasses in sync with the image display.

19. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Songer in view of Wells.

Songer does not disclose a method of claim 8, further comprising generating said colors in said first and second groups of colors with a sequential color device.

Wells discloses a method of claim 8, further comprising generating said colors in said first and second groups of colors with a sequential color device (page 10, column 1, lines 15-18).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to replace the display system disclosed in Songer with the sequential color device disclosed in Wells. The motivation for doing this would have been to allow

for the use of a grayscale CRT monitor instead of a color CRT (page 10, column 1, line 16).

20. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Songer in view of Anderson (An author of a SPIE article titled "Uniform color illumination for scrolling color LCoS projection").

Songer does not disclose a method of claim 8, further comprising generating said colors in said first and second group of colors with a scrolling color device.

Anderson discloses a method of claim 8, further comprising generating said colors in said first and second group of colors with a scrolling color device (section 1, lines 1-3).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to replace the display system disclosed in Songer with the scrolling color device disclosed in Anderson. The motivation for doing this would have been to allow the designer to adjust the relative optical powers of the primary colors by changing the stripe heights of the primary colors (page 1, section 1, lines 10-11).

21. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Songer in view of Sato (An author of a SPIE article titled "New Type Electro-Holographic Display System Using LCDs").

Songer does not disclose a method of claim 8, further comprising generating said colors in said first and second groups of colors with a parallel color device.

Sato discloses a method of claim 8, further comprising generating said colors in said first and second groups of colors with a parallel color device (abstract, paragraph 2, lines 1-4).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to replace the display system disclosed in Songer with the parallel color device disclosed in Sato. The motivation for doing this would have been to make the system more compact (abstract, line 8).

Applicant has provided evidence in this file showing that the invention was owned by, or subject to an obligation of assignment to, the same entity as Childers at the time this invention was made, or was subject to a joint research agreement at the time this invention was made. However, reference Songer additionally qualifies as prior art under another subsection of 35 U.S.C. 102, and therefore, is not disqualified as prior art under 35 U.S.C. 103(c).

Applicant may overcome the applied art either by a showing under 37 CFR 1.132 that the invention disclosed therein was derived from the invention of this application, and is therefore, not the invention "by another," or by antedating the applied art under 37 CFR 1.131.

22. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Songer in view of Divelbiss.

Referring to claim 15, Songer discloses a method of claim 8, further comprising generating said colors in said first and second groups of colors with a diffractive light

device (figure 4, part 72; Note: the definition of a diffractive light device is "a device to change the direction and intensity of a group of waves after passing by an obstacle or through an aperture."). (Note: as the limitations of this claim are rejected based on Songer, no motivation is needed)

23. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Songer in view of Bolas (An author of an IEEE article titled "New Research and Explorations into Multiuser Immersive Display Systems").

Songer and Childers do not disclose a method of claim 15, further comprising notch filtering light incident upon said diffractive light device; and further comprising notch filtering light reflecting from said diffractive light device.

Bolas discloses a method of claim 15, further comprising notch filtering light incident upon said diffractive light device; and further comprising notch filtering light reflecting from said diffractive light device (page 19, section "Optical filtering," paragraph 2, lines 2-8).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the notch filters from Bolas in conjunction with the diffractive light device from Childers. The motivation for doing this would have been to restrict the device to specific wavelengths of light.

24. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Songer in view of Stuetzler.

Songer does not disclose a system of claim 29, further comprising: a first buffer for storing said left image sub-frame data to be used by said spatial light modulator to generate said left image sub-frame; a second buffer for storing said right image sub-frame data to be used by said spatial light modulator to generate said right image sub-frame; and a third buffer for storing said 2D image frame data to be used by said spatial light modulator to generate said 2D image frame.

Stuettler discloses a system of claim 29, further comprising: a first buffer for storing said left image sub-frame data to be used by said spatial light modulator to generate said left image sub-frame; a second buffer for storing said right image sub-frame data to be used by said spatial light modulator to generate said right image sub-frame (column 2, lines 52-56; figure 4, parts 8a); and a third buffer for storing said 2D image frame data to be used by said spatial light modulator to generate said 2D image frame (Note: as the 2D image is made up of both frames used in the 3D image, both buffers in combination are being interpreted as the third 2D buffer).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to add the buffers from Stuettler to the method disclosed by Songer. The motivation for doing this would have been to allow for the display output to be synced up with the shutter glasses by controlling the outputs of the buffer.

25. Claims 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Songer in view of Stuettler as applied to claim 30 above, and further in view of Hochmuth.

Songer and Stuetzler do not disclose a system of claim 30, wherein a single buffer unit comprises said first, second, and third buffers; and a single buffer unit comprises said first and second buffers.

Hochmuth discloses a system of claim 30, wherein a single buffer unit comprises said first, second, and third buffers (page 1, paragraph 9, lines 8-15); and a single buffer unit comprises said first and second buffers (Note: as claim was interpreted above, the two buffers used in the 3D mode are both used as the buffers in the 2D mode, therefore the combination of the two buffers used in the 3D mode would be the same as the all three buffers being combined as disclosed in claim 31).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to replace the three buffers disclosed in Stuetzler with the single buffer from Hochmuth. The motivation for doing this would have been to reduce the amount of control circuitry by only needing to control a single buffer unit.

26. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Songer in view of Divelbiss.

Songer does not disclose a system of claim 27, wherein said left image sub-frame comprises a first group of colors and said right image sub-frame comprises a second group of colors distinct from said first group of colors.

Divelbiss discloses a system of claim 27, wherein said left image sub-frame comprises a first group of colors and said right image sub-frame comprises a second group of colors distinct from said first group of colors ((page 18, paragraph 222, lines 1-

7, 14-20; Note: because green is made up of blue and yellow, and magenta is made up of blue and red, these are being interpreted as different sets of colors).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to replace the shutter glasses method disclosed in Songer with the color and polarization method disclosed in Divelbiss. The motivation for doing this would have been to use a simpler passive system as compared to the complex syncing circuitry needed to keep the shutter glasses in sync with the image display.

27. Claim 47 is rejected under 35 U.S.C. 103(a) as being unpatentable over Songer in view of Anderson.

Songer discloses a system of claim 27; wherein said spatial light modulator is selected from the group consisting of an analog based light modulator (column 5, lines 59-62).

Songer does not disclose a system of claim 27, wherein said spatial light modulator is selected from the group consisting of a pulse-width modulation based light modulator, a liquid crystal display (LCD) panel, a liquid crystal on silicon (LCOS) device, a diffractive light device (DLD), and an array of micro-mirrors.

Anderson discloses a system of claim 27, wherein said spatial light modulator is selected from the group consisting of a liquid crystal on silicon (LCOS) device (page 1, section 1, lines 1-3).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to replace the display system disclosed in Songer with the scrolling color

Art Unit: 2617

device disclosed in Anderson. The motivation for doing this would have been to allow the designer to adjust the relative optical powers of the primary colors by changing the stripe heights of the primary colors (page 1, section 1, lines 10-11).

28. Claims 50 and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Divelbiss in view of Stuetzler.

Divelbiss does not disclose a device of claim 48, further comprising one or more image sub-frame buffers for storing said image sub-frame data generated by said image processing unit; and displays said at least one image sub-frame and said at least one other image sub-frame buffer during one frame period.

Stuetzler discloses a device of claim 48, further comprising one or more image sub-frame buffers for storing said image sub-frame data generated by said image processing unit; and displays said at least one image sub-frame and said at least one other image sub-frame buffer during one frame period (column 2, lines 52-56; figure 4, parts 8a).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to add the buffers from Stuetzler to the method disclosed by Divelbiss. The motivation for doing this would have been to allow for the display output to be synced up with the shutter glasses by controlling the outputs of the buffer.

29. Claims 51 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Divelbiss in view of Bolas.

Divelbiss does not disclose a device of claim 48, further comprising: a light source for illuminating said color modulator; and at least one notch filter disposed between said light source and said color modulator; and at least one notch filter disposed between said color modulator and a viewing surface.

Bolas discloses a device of claim 48, further comprising: a light source for illuminating said color modulator; and at least one notch filter disposed between said light source and said color modulator; and at least one notch filter disposed between said color modulator and a viewing surface (page 19, section "Optical filtering," paragraph 2, lines 2-8).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the notch filters from Bolas in conjunction with the projector system from Divelbiss. The motivation for doing this would have been to restrict the device to specific wavelengths of light.

30. Claims 57 and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Divelbiss in view of Songer.

Divelbiss discloses a device of claim 57, wherein said 2D image frame includes said first set of primary colors and said second set of primary colors.

Divelbiss does not disclose a device of claim 48, wherein said imaging processing unit is further configured to generate 2D image frame data, wherein said color modulator generates a 2D image frame based on said 2D image frame data.

Songer discloses a device of claim 48, wherein said imaging processing unit is further configured to generate 2D image frame data, wherein said color modulator generates a 2D image frame based on said 2D image frame data (column 6, lines 30-35).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to add the 2D method from Songer into the display disclosed by Divelbiss. The motivation for doing this would have been to add the ability to display 2D images on the same display and the same time as 3D images are being displayed.

31. Claims 62 and 63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Songer in view of Stuetzler.

Songer discloses a system of claim 61, wherein said means for generating said left and right image sub-frames comprises: means for generating left and right image sub-frame data defining said left and right image sub-frames.

Songer does not disclose a means for storing said left image sub-frame data in a first buffer; means for storing said right image sub-frame data in a second buffer; and means for controlling a spatial light modulator with said left and right image sub-frame data in said first and second buffers to generate said left and right image sub-frames; and a means for generating said 2D image frame comprises: means for generating 2D image frame data defining said 2D image frame; means for storing said 2D image frame data in a buffer; and means for controlling a spatial light modulator with said 2D image

frame data in said buffer to generate said 2D image frame (column 2, lines 52-56; figure 4, parts 8a).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to add the buffers from Stuetzler to the method disclosed by Songer. The motivation for doing this would have been to allow for the display output to be synced up with the shutter glasses by controlling the outputs of the buffer.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to observe that if the method disclosed by Songer displays images that can be viewed in either two or three dimensions depending on whether or not you're wearing a pair of glasses, that the buffering of the 3D frames described in Stuetzler would also be buffering the 2D frames.

Claims 61 and 67 are rejected under 35 U.S.C. 103(a) as being unpatentable over Songer in view of Taniguchi.

Referring to claim 61, Songer discloses a system for displaying an image frame in three dimensions (3D) or in two dimensions (2D) with a single light engine (column 5, lines 59-62), said system comprising: means for selecting between a 2D mode of operation and a 3D mode of operation (column 6, lines 30-35); means for generating a left image sub-frame and a right image sub-frame if said 3D mode of operation is selected; and means for generating a 2D image frame if said 2D mode of operation is selected; wherein said left and right image sub-frames are left and right perspectives during a frame period if said 3D mode of operation (column 5, lines 48-50) is selected

Art Unit: 2617

and said 2D image frame is displayed during said frame period if said 2D mode of operation is selected.

Songer does not disclose a system where said 2D image frame does not comprise sub-frames having different perspectives.

Taniguchi discloses a system where said 2D image frame does not comprise sub-frames having different perspectives (paragraph 81, lines 1-2; paragraph 82, lines 6-11).

At the time of the invention it would have been obvious for one of ordinary skill in the art to have a 2D display mode where the 2D image is not made from 2 sub-frames as taught by Taniguchi, in the system disclosed by Songer. The motivation for doing this would be when the 2D image is coming from a 2D imaging device such as a normal camera (Taniguchi: paragraph 82, lines 1-3).

Referring to claim 67, Songer does not disclose a method of claim 1, wherein generating said left and right image sub-frames and said 2D image frame comprises: storing said left and right image sub-frames in a first buffer; and storing said 2D image frame data in a second buffer; and controlling a spatial light modulator with data from either said first or second buffer depending on the selected mode of operation.

Taniguchi discloses a method of claim 1, wherein generating said left and right image sub-frames and said 2D image frame comprises: storing said left and right image sub-frames in a first buffer (paragraph 93, lines 3-8); and storing said 2D image frame data in a second buffer (paragraph 82, lines 12-14); and controlling a spatial light

Art Unit: 2617

modulator with data from either said first or second buffer depending on the selected mode of operation (paragraph 82, lines 6-11).

At the time of the invention it would have been obvious for one of ordinary skill in the art to use one buffer for 2D and another for 3D images as taught by Taniguchi in the system disclosed by Songer. The motivation for doing this would have been to easily switch between 2D and 3D displaying modes as the modes would use separate memories (Taniguchi: paragraph 81, lines 1-2).

Claim 37 is rejected on the same grounds as claim 9.

Claim 38 is rejected on the same grounds as claim 10.

Claim 39 is rejected on the same grounds as claim 12.

Claim 40 is rejected on the same grounds as claim 12.

Claim 41 is rejected on the same grounds as claim 14.

Claim 42 is rejected on the same grounds as claim 15.

Claims 43 and 44 are rejected on the same grounds as claims 16 and 17.

Allowable Subject Matter


32. Claims 11, 25, and 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin E. Shepard whose telephone number is (571) 272-5967. The examiner can normally be reached on 7:30-5 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Kelley can be reached on (571) 272-7331. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JS


CHRIS KELLEY
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600